

SEQUENCE LISTING

<110> Novartis AG et al.

<120> GENES INVOLVED IN NEURODEGENERATIVE DISORDERS

<130> PN/4-33424A/USN

<140> PCT/EP2004/011926

<141> 2004-10-21

<150> US60/513241

<151> 2003-10-22

<160> 40

<170> PatentIn version 3.2

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Cys Lys Tyr Cys Asp Lys Glu Tyr Val Ser Leu Gly Ala Leu Lys Met
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Gly Gly Ala Ser Ala Glu Gly Gly Pro Thr Gly Leu Ala His Gly Arg
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Leu Gly Ser Gly Leu Val Ala Pro Val Ser Pro Tyr Lys Pro Gly Gln
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Ala Gly Ala Tyr Ala Gly Tyr Pro Pro Gln Phe Leu Pro His Gly Val
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Pro Leu Ala Gly Ala Ser Pro Pro Ser Val Met Thr Ala Ser Leu Cys

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Ala Ala Leu Lys Ser Gly Tyr Pro Leu Val Tyr Pro Thr His Pro Leu
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His Gly Val His Ser Ser Leu Thr Ala Ala Ala Ala Ala Gly Ala Thr
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Pro Pro Ser Leu Ala Gly His Pro Leu Tyr Pro Tyr Gly Phe Met Leu
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Pro Cys Asp Lys Arg Phe Ala Thr Ser Glu Glu Leu Leu Ser His Leu
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Arg Thr His Thr Ala Phe Pro Gly Thr Asp Lys Leu Leu Ser Gly Tyr
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Cys Val Ser Val Val Val Ile Ala Ala Ile Val Leu Ala Ile Thr Leu
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Arg Arg Pro Gly Cys Glu Leu Glu Ala Cys Ser Pro Asp Ala Asp Met
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Leu Asp Tyr Leu Leu Ser Leu Gly Gln Ile Ser Arg Arg Asp Ala Leu
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Leu Gly Ser Ser Gln Lys Gly Ile Lys Leu Asp Phe Lys Asn Ile Lys
180 185 190

Ala Val Gly Pro Ser Leu Asp Leu Leu Arg Gln Leu Thr Glu Glu Gly
195 200 205

Lys Val Arg Arg Pro Ile Trp Ile Asn Ala Asp Ile Leu Lys Gly Pro
210 215 220

Asn Met Leu Ile Ser Thr Glu Val Asn Ala Thr Gln Phe Leu Ala Leu
225 230 235 240

Val Gln Glu Lys Tyr Pro Lys Ala Thr Leu Ser Pro Gly Trp Thr Thr
245 250 255

Phe Tyr Met Ser Thr Ser Pro Asn Arg Thr Tyr Thr Gln Ala Met Val
260 265 270

Glu Lys Met His Glu Leu Val Gly Gly Val Pro Gln Arg Val Thr Phe
275 280 285

Pro Val Arg Ser Ser Met Val Arg Ala Ala Trp Pro His Phe Ser Trp
290 295 300

Leu Leu Ser Gln Ser Glu Arg Tyr Ser Leu Thr Leu Trp Gln Ala Ala
305 310 315 320

Ser Asp Pro Met Ser Val Glu Asp Leu Leu Tyr Val Arg Asp Asn Thr
325 330 335

Ala Val His Gln Val Tyr Tyr Asp Ile Phe Glu Pro Leu Leu Ser Gln
340 345 350

Phe Lys Gln Leu Ala Leu Asn Ala Thr Arg Lys Pro Met Tyr Tyr Thr
355 360 365

Gly Gly Ser Leu Ile Pro Leu Leu Gln Leu Pro Gly Asp Asp Gly Leu
370 375 380

Asn Val Glu Trp Leu Val Pro Asp Val Gln Gly Ser Gly Lys Thr Ala
385 390 395 400

Thr Met Thr Leu Pro Asp Thr Glu Gly Met Ile Leu Leu Asn Thr Gly
405 410 415

Leu Glu Gly Thr Val Ala Glu Asn Pro Val Pro Ile Val His Thr Pro
420 425 430

Ser Gly Asn Ile Leu Thr Leu Glu Ser Cys Leu Gln Gln Leu Ala Thr
435 440 445

His Pro Gly His Trp Gly Ile His Leu Gln Ile Val Glu Pro Ala Ala
450 455 460

Leu Arg Pro Ser Leu Ala Leu Leu Ala Arg Leu Ser Ser Leu Gly Leu
465 470 475 480

Leu His Trp Pro Val Trp Val Gly Ala Lys Ile Ser His Gly Ser Phe
485 490 495

Ser Val Pro Gly His Val Ala Gly Arg Glu Leu Leu Thr Ala Val Ala
500 505 510

Glu Val Phe Pro His Val Thr Val Ala Pro Gly Trp Pro Glu Glu Val
 515 520 525

Leu Gly Ser Gly Tyr Arg Glu Gln Leu Leu Thr Asp Met Leu Glu Leu
 530 535 540

Cys Gln Gly Leu Trp Gln Pro Val Ser Phe Gln Met Gln Ala Met Leu
 545 550 555 560

Leu Gly His Ser Thr Ala Gly Ala Ile Gly Arg Leu Leu Ala Ser Ser
 565 570 575

Pro Arg Ala Thr Val Thr Val Glu His Asn Pro Ala Gly Gly Asp Tyr
 580 585 590

Ala Ser Val Arg Thr Ala Leu Leu Ala Ala Arg Ala Val Asp Arg Thr
 595 600 605

Arg Val Tyr Tyr Arg Leu Pro Gln Gly Tyr His Lys Asp Leu Leu Ala
 610 615 620

His Val Gly Arg Asn
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<210> 7
 <211> 3037
 <212> DNA
 <213> Homo sapiens

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 gcttcgtcca ggaggtgttc tgctcagatg aggagcttgc caccgtcccg ctggacatcc 240
 cgccatatac gaaaaacatc atctttgtgg agacctcgtt caccacattg gaaaccagag 300
 cttttggcag taaccccaac ttgaccaagg tggctcttct caacactcag ctctgccagt 360
 ttaggccgga tgcctttggg gggctgcca ggctggagga cctggaggtc acaggcagta 420
 gcttcttgaa cctcagcacc aacatcttct ccaacctgac ctgctgggc aagctcaccc 480
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<210> 8
 <211> 545
 <212> PRT
 <213> Homo sapiens

<400> 8

Met Leu Pro Gly Ala Trp Leu Leu Trp Thr Ser Leu Leu Leu Leu Ala
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Arg Pro Ala Gln Pro Cys Pro Met Gly Cys Asp Cys Phe Val Gln Glu
 20 25 30

Val Phe Cys Ser Asp Glu Glu Leu Ala Thr Val Pro Leu Asp Ile Pro
 35 40 45

Pro Tyr Thr Lys Asn Ile Ile Phe Val Glu Thr Ser Phe Thr Thr Leu
 50 55 60

Glu Thr Arg Ala Phe Gly Ser Asn Pro Asn Leu Thr Lys Val Val Phe
 65 70 75 80

Leu Asn Thr Gln Leu Cys Gln Phe Arg Pro Asp Ala Phe Gly Gly Leu
 85 90 95

Pro Arg Leu Glu Asp Leu Glu Val Thr Gly Ser Ser Phe Leu Asn Leu
100 105 110

Ser Thr Asn Ile Phe Ser Asn Leu Thr Ser Leu Gly Lys Leu Thr Leu
115 120 125

Asn Phe Asn Met Leu Glu Ala Leu Pro Glu Gly Leu Phe Gln His Leu
130 135 140

Ala Ala Leu Glu Ser Leu His Leu Gln Gly Asn Gln Leu Gln Ala Leu
145 150 155 160

Pro Arg Arg Leu Phe Gln Pro Leu Thr His Leu Lys Thr Leu Asn Leu
165 170 175

Ala Gln Asn Leu Leu Ala Gln Leu Pro Glu Glu Leu Phe His Pro Leu
180 185 190

Thr Ser Leu Gln Thr Leu Lys Leu Ser Asn Asn Ala Leu Ser Gly Leu
195 200 205

Pro Gln Gly Val Phe Gly Lys Leu Gly Ser Leu Gln Glu Leu Phe Leu
210 215 220

Asp Ser Asn Asn Ile Ser Glu Leu Pro Pro Gln Val Phe Ser Gln Leu
225 230 235 240

Phe Cys Leu Glu Arg Leu Trp Leu Gln Arg Asn Ala Ile Thr His Leu
245 250 255

Pro Leu Ser Ile Phe Ala Ser Leu Gly Asn Leu Thr Phe Leu Ser Leu
260 265 270

Gln Trp Asn Met Leu Arg Val Leu Pro Ala Gly Leu Phe Ala His Thr
275 280 285

Pro Cys Leu Val Gly Leu Ser Leu Thr His Asn Gln Leu Glu Thr Val
290 295 300

Ala Glu Gly Thr Phe Ala His Leu Ser Asn Leu Arg Ser Leu Met Leu
305 310 315 320

Ser Tyr Asn Ala Ile Thr His Leu Pro Ala Gly Ile Phe Arg Asp Leu
325 330 335

Glu Glu Leu Val Lys Leu Tyr Leu Gly Ser Asn Asn Leu Thr Ala Leu
340 345 350

His Pro Ala Leu Phe Gln Asn Leu Ser Lys Leu Glu Leu Leu Ser Leu
355 360 365

Ser Lys Asn Gln Leu Thr Thr Leu Pro Glu Gly Ile Phe Asp Thr Asn
370 375 380

Tyr Asn Leu Phe Asn Leu Ala Leu His Gly Asn Pro Trp Gln Cys Asp
385 390 395 400

Cys His Leu Ala Tyr Leu Phe Asn Trp Leu Gln Gln Tyr Thr Asp Arg
405 410 415

Leu Leu Asn Ile Gln Thr Tyr Cys Ala Gly Pro Ala Tyr Leu Lys Gly
420 425 430

Gln Val Val Pro Ala Leu Asn Glu Lys Gln Leu Val Cys Pro Val Thr
435 440 445

Arg Asp His Leu Gly Phe Gln Val Thr Trp Pro Asp Glu Ser Lys Ala
450 455 460

Gly Gly Ser Trp Asp Leu Ala Val Gln Glu Arg Ala Ala Arg Ser Gln
465 470 475 480

Cys Thr Tyr Ser Asn Pro Glu Gly Thr Val Val Leu Ala Cys Asp Gln
485 490 495

Ala Gln Cys Arg Trp Leu Asn Val Gln Leu Ser Pro Arg Gln Gly Ser
500 505 510

Leu Gly Leu Gln Tyr Asn Ala Ser Gln Glu Trp Asp Leu Arg Ser Ser
515 520 525

Cys Gly Ser Leu Arg Leu Thr Val Ser Ile Glu Ala Arg Ala Ala Gly
530 535 540

Pro

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 <211> 1846
 <212> DNA
 <213> Homo sapiens

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<210> 10
 <211> 414
 <212> PRT
 <213> Homo sapiens

<400> 10

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Gly Ala Ala Leu Pro Leu Arg Pro Arg Pro Pro Leu Pro Ala Ser Pro
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Ala Arg Pro Leu Leu Pro Ala Ala Arg Gln Ser Gln Ala Pro Ala Leu
 35 40 45

Gly Arg Pro Arg Ala Arg Arg Pro Gly Thr Ser Val Ala Ala His Ala
 50 55 60

Asp Arg Cys Pro Pro Pro Pro Pro Gln Ala Ala Leu Ala Ala Ala Leu
 65 70 75 80

Gly Pro Ala Glu Ala Gly Met Leu Glu Lys Leu Glu Phe Glu Asp Glu
 85 90 95

Ala Val Glu Asp Ser Glu Ser Gly Val Tyr Met Arg Phe Met Arg Ser
 100 105 110

His Lys Cys Tyr Asp Ile Val Pro Thr Ser Ser Lys Leu Val Val Phe
 115 120 125

Asp Thr Thr Leu Gln Val Lys Lys Ala Phe Phe Ala Leu Val Ala Asn
 130 135 140

Gly Val Arg Ala Ala Pro Leu Trp Glu Ser Lys Lys Gln Ser Phe Val
145 150 155 160

Gly Met Leu Thr Ile Thr Asp Phe Ile Asn Ile Leu His Arg Tyr Tyr
165 170 175

Lys Ser Pro Met Val Gln Ile Tyr Glu Leu Glu Glu His Lys Ile Glu
180 185 190

Thr Trp Arg Glu Leu Tyr Leu Gln Glu Thr Phe Lys Pro Leu Val Asn
195 200 205

Ile Ser Pro Asp Ala Ser Leu Phe Asp Ala Val Tyr Ser Leu Ile Lys
210 215 220

Asn Lys Ile His Arg Leu Pro Val Ile Asp Pro Ile Ser Gly Asn Ala
225 230 235 240

Leu Tyr Ile Leu Thr His Lys Arg Ile Leu Lys Phe Leu Gln Leu Phe
245 250 255

Met Ser Asp Met Pro Lys Pro Ala Phe Met Lys Gln Asn Leu Asp Glu
260 265 270

Leu Gly Ile Gly Thr Tyr His Asn Ile Ala Phe Ile His Pro Asp Thr
275 280 285

Pro Ile Ile Lys Ala Leu Asn Ile Phe Val Glu Arg Arg Ile Ser Ala
290 295 300

Leu Pro Val Val Asp Glu Ser Gly Lys Val Val Asp Ile Tyr Ser Lys
305 310 315 320

Phe Asp Val Ile Asn Leu Ala Ala Glu Lys Thr Tyr Asn Asn Leu Asp
325 330 335

Ile Thr Val Thr Gln Ala Leu Gln His Arg Ser Gln Tyr Phe Glu Gly
340 345 350

Val Val Lys Cys Asn Lys Leu Glu Ile Leu Glu Thr Ile Val Asp Arg
355 360 365

Ile Val Arg Ala Glu Val His Arg Leu Val Val Val Asn Glu Ala Asp
 370 375 380

Ser Ile Val Gly Ile Ile Ser Leu Ser Asp Ile Leu Gln Ala Leu Ile
 385 390 395 400

Leu Thr Pro Ala Gly Ala Lys Gln Lys Glu Thr Glu Thr Glu
 405 410

<210> 11
 <211> 2813
 <212> DNA
 <213> Homo sapiens

<400> 11
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<211> 818
<212> PRT
<213> Homo sapiens

<400> 12

Ser Leu Gln Ala Ala Ser Thr Gln Pro Gln Ala Thr Ala Leu Pro Ser
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Gln Ser Leu Glu Ile His Pro Leu Gly Pro Ala His Pro Asn Ser Asn
20 25 30

Pro Leu Gly Pro Ser Leu Gln Gly Pro Asp Cys Gly Arg Gln Pro Leu
35 40 45

Leu Ser Glu Gln Arg Phe Leu Arg Gly Ala Leu Pro Ser Arg Ala Leu
50 55 60

Leu Met Gly Lys Ser Glu Gly Pro Val Gly Met Val Glu Ser Ala Gly
65 70 75 80

Arg Ala Gly Gln Lys Arg Pro Gly Phe Leu Glu Gly Gly Leu Leu Leu
85 90 95

Leu Leu Leu Leu Val Thr Ala Ala Leu Val Ala Leu Gly Val Leu Tyr
100 105 110

Ala Asp Arg Arg Gly Ile Pro Glu Ala Gln Glu Val Ser Glu Val Cys
115 120 125

Thr Thr Pro Gly Cys Val Ile Ala Ala Ala Arg Ile Leu Gln Asn Met
130 135 140

Asp Pro Thr Thr Glu Pro Cys Asp Asp Phe Tyr Gln Phe Ala Cys Gly
145 150 155 160

Gly Trp Leu Arg Arg His Val Ile Pro Glu Thr Asn Ser Arg Tyr Ser
165 170 175

Ile Phe Asp Val Leu Arg Asp Glu Leu Glu Val Ile Leu Lys Ala Val
180 185 190

Leu Glu Asn Ser Thr Ala Lys Asp Arg Pro Ala Val Glu Lys Ala Arg
195 200 205

Thr Leu Tyr Arg Ser Cys Met Asn Gln Ser Val Ile Glu Lys Arg Gly
210 215 220

Ser Gln Pro Leu Leu Asp Ile Leu Glu Val Val Gly Gly Trp Pro Val
225 230 235 240

Ala Met Asp Arg Trp Asn Glu Thr Val Gly Leu Glu Trp Glu Leu Glu
245 250 255

Arg Gln Leu Ala Leu Met Asn Ser Gln Phe Asn Arg Arg Val Leu Ile
260 265 270

Asp Leu Phe Ile Trp Asn Asp Asp Gln Asn Ser Ser Arg His Ile Ile
275 280 285

Tyr Ile Asp Gln Pro Thr Leu Gly Met Pro Ser Arg Glu Tyr Tyr Phe
290 295 300

Asn Gly Gly Ser Asn Arg Lys Val Arg Glu Ala Tyr Leu Gln Phe Met
305 310 315 320

Val Ser Val Ala Thr Leu Leu Arg Glu Asp Ala Asn Leu Pro Arg Asp
325 330 335

Ser Cys Leu Val Gln Glu Asp Met Val Gln Val Leu Glu Leu Glu Thr
340 345 350

Gln Leu Ala Lys Ala Thr Val Pro Gln Glu Glu Arg His Asp Val Ile
355 360 365

Ala Leu Tyr His Arg Met Gly Leu Glu Glu Leu Gln Ser Gln Phe Gly
370 375 380

Leu Lys Gly Phe Asn Trp Thr Leu Phe Ile Gln Thr Val Leu Ser Ser
385 390 395 400

Val Lys Ile Lys Leu Leu Pro Asp Glu Glu Val Val Val Tyr Gly Ile
405 410 415

Pro Tyr Leu Gln Asn Leu Glu Asn Ile Ile Asp Thr Tyr Ser Ala Arg
420 425 430

Thr Ile Gln Asn Tyr Leu Val Trp Arg Leu Val Leu Asp Arg Ile Gly
435 440 445

Ser Leu Ser Gln Arg Phe Lys Asp Thr Arg Val Asn Tyr Arg Lys Ala
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Leu Phe Gly Thr Met Val Glu Glu Val Arg Trp Arg Glu Cys Val Gly
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Tyr Val Asn Ser Asn Met Glu Asn Ala Val Gly Ser Leu Tyr Val Arg
485 490 495

Glu Ala Phe Pro Gly Asp Ser Lys Ser Met Val Arg Glu Leu Ile Asp
500 505 510

Lys Val Arg Thr Val Phe Val Glu Thr Leu Asp Glu Leu Gly Trp Met
515 520 525

Asp Glu Glu Ser Lys Lys Lys Ala Gln Glu Lys Ala Met Ser Ile Arg
530 535 540

Glu Gln Ile Gly His Pro Asp Tyr Ile Leu Glu Glu Met Asn Arg Arg
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Leu Asp Glu Glu Tyr Ser Asn Leu Asn Phe Ser Glu Asp Leu Tyr Phe
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Glu Asn Ser Leu Gln Asn Leu Lys Val Gly Ala Gln Arg Ser Leu Arg
580 585 590

Lys Leu Arg Glu Lys Val Asp Pro Asn Leu Trp Ile Ile Gly Ala Ala
595 600 605

Val Val Asn Ala Phe Tyr Ser Pro Asn Arg Asn Gln Ile Val Phe Pro
610 615 620

Ala Gly Ile Leu Gln Pro Pro Phe Phe Ser Lys Glu Gln Pro Gln Ala
625 630 635 640

Leu Asn Phe Gly Gly Ile Gly Met Val Ile Gly His Glu Ile Thr His
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Gly Phe Asp Asp Asn Gly Arg Asn Phe Asp Lys Asn Gly Asn Met Met

660

665

670

Asp Trp Trp Ser Asn Phe Ser Thr Gln His Phe Arg Glu Gln Ser Glu
675 680 685

Cys Met Ile Tyr Gln Tyr Gly Asn Tyr Ser Trp Asp Leu Ala Asp Glu
690 695 700

Gln Asn Val Asn Gly Phe Asn Thr Leu Gly Glu Asn Ile Ala Asp Asn
705 710 715 720

Gly Gly Val Arg Gln Ala Tyr Lys Ala Tyr Leu Lys Trp Met Ala Glu
725 730 735

Gly Gly Lys Asp Gln Gln Leu Pro Gly Leu Asp Leu Thr His Glu Gln
740 745 750

Leu Phe Phe Ile Asn Tyr Ala Gln Val Trp Cys Gly Ser Tyr Arg Pro
755 760 765

Glu Phe Ala Ile Gln Ser Ile Lys Thr Asp Val His Ser Pro Leu Lys
770 775 780

Tyr Arg Val Leu Gly Ser Leu Gln Asn Leu Ala Ala Phe Ala Asp Thr
785 790 795 800

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Val Trp

<210> 13
<211> 3662
<212> DNA
<213> Homo sapiens

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3662

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<211> 795
<212> PRT
<213> Homo sapiens

<400> 14

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Arg Pro Ser Arg Trp Leu Ile Gln Val Ala Phe Ala Ala Leu Leu Arg
35 40 45

Pro Asn Gln Ser Ala Gly His Leu Ala Ala Gln Leu Thr Pro Arg Pro
50 55 60

Arg Ser Gln Ala Pro Gly Phe Leu Lys Cys Phe Leu Gly Ala Leu Lys
65 70 75 80

Met Glu Met Thr Glu Met Thr Gly Val Ser Leu Lys Arg Gly Ala Leu
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Val Val Glu Asp Asn Asp Ser Gly Val Pro Val Glu Glu Thr Lys Lys
100 105 110

Gln Lys Leu Ser Glu Cys Ser Leu Thr Lys Gly Gln Asp Gly Leu Gln
115 120 125

Asn Asp Phe Leu Ser Ile Ser Glu Asp Val Pro Arg Pro Pro Asp Thr
130 135 140

Val Ser Thr Gly Lys Gly Gly Lys Asn Ser Glu Ala Gln Leu Glu Asp
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165 170 175

Glu Ser Glu Ser Phe Ala Asp Met Met Lys His Gly Leu Thr Glu Ala
180 185 190

Asp Val Gly Ile Thr Lys Phe Val Ser Ser His Gln Gly Phe Ser Gly
195 200 205

Ile Leu Lys Glu Arg Tyr Ser Asp Phe Val Val His Glu Ile Gly Lys
210 215 220

Asp Gly Arg Ile Ser His Leu Asn Asp Leu Ser Ile Pro Val Asp Glu
225 230 235 240

Glu Asp Pro Ser Glu Asp Ile Phe Thr Val Leu Thr Ala Glu Glu Lys
245 250 255

Gln Arg Leu Glu Glu Leu Gln Leu Phe Lys Asn Lys Glu Thr Ser Val
260 265 270

Ala Ile Glu Val Ile Glu Asp Thr Lys Glu Lys Arg Thr Ile Ile His
275 280 285

Gln Ala Ile Lys Ser Leu Phe Pro Gly Leu Glu Thr Lys Thr Glu Asp
290 295 300

Arg Glu Gly Lys Lys Tyr Ile Val Ala Tyr His Ala Ala Gly Lys Lys
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Ala Leu Ala Ser Glu Val Ser Val Ser Ser Phe Leu Leu Pro Gly Ser
325 330 335

Arg Glu Arg Gln Ala Pro Leu Leu Val Gln Pro Cys Pro Phe Val Phe
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Lys Gly Tyr Tyr Ser Ala Ala Gln Arg Thr Ile Leu Ile Met Ser Leu
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Leu Gln Arg Gly Gly Gln Asn Cys Gln Asp Pro Arg Lys His Ser Trp
370 375 380

Pro Lys Ser Arg Gly Ser Tyr Cys His Phe Val Leu Tyr Lys Glu Asn
385 390 395 400

Lys Asp Thr Met Asp Ala Ile Asn Val Leu Ser Lys Tyr Leu Arg Val
405 410 415

Lys Pro Asn Ile Phe Ser Tyr Met Gly Thr Lys Asp Lys Arg Ala Ile
420 425 430

Thr Val Gln Glu Ile Ala Val Leu Lys Ile Thr Ala Gln Arg Leu Ala
435 440 445

His Leu Asn Lys Cys Leu Met Asn Phe Lys Leu Gly Asn Phe Ser Tyr
450 455 460

Gln Lys Asn Pro Leu Lys Leu Gly Glu Leu Gln Gly Asn His Phe Thr
465 470 475 480

Val Val Leu Arg Asn Ile Thr Gly Thr Asp Asp Gln Val Gln Gln Ala
485 490 495

Met Asn Ser Leu Lys Glu Ile Gly Phe Ile Asn Tyr Tyr Gly Met Gln
500 505 510

Arg Phe Gly Thr Thr Ala Val Pro Thr Tyr Gln Val Gly Arg Ala Ile
515 520 525

Leu Gln Asn Ser Trp Thr Glu Val Met Asp Leu Ile Leu Lys Pro Arg
530 535 540

Ser Gly Ala Glu Lys Gly Tyr Leu Val Lys Cys Arg Glu Glu Trp Ala
545 550 555 560

Lys Thr Lys Asp Pro Thr Ala Ala Leu Arg Lys Leu Pro Val Lys Arg
565 570 575

Cys Val Glu Gly Gln Leu Leu Arg Gly Leu Ser Lys Tyr Gly Met Lys
580 585 590

Asn Ile Val Ser Ala Phe Gly Ile Ile Pro Arg Asn Asn Arg Leu Met
595 600 605

Tyr Ile His Ser Tyr Gln Ser Tyr Val Trp Asn Asn Met Val Ser Lys
610 615 620

Arg Ile Glu Asp Tyr Gly Leu Lys Pro Val Pro Gly Asp Leu Val Leu
625 630 635 640

Lys Gly Ala Thr Ala Thr Tyr Ile Glu Glu Asp Asp Val Asn Asn Tyr

645	650	655
Ser Ile His Asp Val Val Met Pro Leu Pro Gly Phe Asp Val Ile Tyr		
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Pro Lys His Lys Ile Gln Glu Ala Tyr Arg Glu Met Leu Thr Ala Asp		
675	680	685
Asn Leu Asp Ile Asp Asn Met Arg His Lys Ile Arg Asp Tyr Ser Leu		
690	695	700
Ser Gly Ala Tyr Arg Lys Ile Ile Ile Arg Pro Gln Asn Val Ser Trp		
705	710	715
Glu Val Val Ala Tyr Asp Asp Pro Lys Ile Pro Leu Phe Asn Thr Asp		
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Val Asp Asn Leu Glu Gly Lys Thr Pro Pro Val Phe Ala Ser Glu Gly		
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Lys Tyr Arg Ala Leu Lys Met Asp Phe Ser Leu Pro Pro Ser Thr Tyr		
755	760	765
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<400> 16

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Met Glu Ser Lys Val Ser Glu Gly Gly Leu Asn Val Thr Leu Thr Ile
35 40 45

Arg Leu Leu Met His Gly Lys Glu Val Gly Ser Ile Ile Gly Lys Lys
50 55 60

Gly Glu Thr Val Lys Lys Met Arg Glu Glu Ser Gly Ala Arg Ile Asn
65 70 75 80

Ile Ser Glu Gly Asn Cys Pro Glu Arg Ile Val Thr Ile Thr Gly Pro
85 90 95

Thr Asp Ala Ile Phe Lys Ala Phe Ala Met Ile Ala Tyr Lys Phe Glu
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Glu Asp Ile Ile Asn Ser Met Ser Asn Ser Pro Ala Thr Ser Lys Pro
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Pro Val Thr Leu Arg Leu Val Val Pro Ala Ser Gln Cys Gly Ser Leu
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Ile Gly Lys Gly Gly Ser Lys Ile Lys Glu Ile Arg Glu Ser Thr Gly
145 150 155 160

Ala Gln Val Gln Val Ala Gly Asp Met Leu Pro Asn Ser Thr Glu Arg
165 170 175

Ala Val Thr Ile Ser Gly Thr Pro Asp Ala Ile Ile Gln Cys Val Lys
180 185 190

Gln Ile Cys Val Val Met Leu Glu Ser Pro Pro Lys Gly Ala Thr Ile
195 200 205

Pro Tyr Arg Pro Lys Pro Ala Ser Thr Pro Val Ile Phe Ala Gly Gly
210 215 220

Gln Ala Tyr Thr Ile Gln Gly Gln Tyr Ala Ile Pro His Pro Asp Gln
225 230 235 240

Leu Thr Lys Leu His Gln Leu Ala Met Gln Gln Thr Pro Phe Pro Pro
245 250 255

Leu Gly Gln Thr Asn Pro Ala Phe Pro Gly Glu Lys Leu Pro Leu His
260 265 270

Ser Ser Glu Glu Ala Gln Asn Leu Met Gly Gln Ser Ser Gly Leu Asp
275 280 285

Ala Ser Pro Pro Ala Ser Thr His Glu Leu Thr Ile Pro Asn Asp Leu
290 295 300

Ile Gly Cys Ile Ile Gly Arg Gln Gly Thr Lys Ile Asn Glu Ile Arg
305 310 315 320

Gln Met Ser Gly Ala Gln Ile Lys Ile Ala Asn Ala Thr Glu Gly Ser
325 330 335

Ser Glu Arg Gln Ile Thr Ile Thr Gly Thr Pro Ala Asn Ile Ser Leu
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Gly Thr Leu
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<211> 5184
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Gly Arg His Arg Glu Lys His Asp Leu Glu Val Ala Val Lys Cys Ile
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Asn Lys Lys Asn Leu Ala Lys Ser Gln Thr Leu Leu Gly Lys Glu Ile
 50 55 60

Lys Ile Leu Lys Glu Leu Lys His Glu Asn Ile Val Ala Leu Tyr Asp
 65 70 75 80

Phe Gln Glu Met Ala Asn Ser Val Tyr Leu Val Met Glu Tyr Cys Asn
 85 90 95

Gly Gly Asp Leu Ala Asp Tyr Leu His Ala Met Arg Thr Leu Ser Glu
 100 105 110

Asp Thr Ile Arg Leu Phe Leu Gln Gln Ile Ala Gly Ala Met Arg Leu
 115 120 125

Leu His Ser Lys Gly Ile Ile His Arg Asp Leu Lys Pro Gln Asn Ile
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Leu Leu Ser Asn Pro Ala Gly Arg Arg Ala Asn Pro Asn Ser Ile Arg
 145 150 155 160

Val Lys Ile Ala Asp Phe Gly Phe Ala Arg Tyr Leu Gln Ser Asn Met

165

170

175

Met Ala Ala Thr Leu Cys Gly Ser Pro Met Tyr Met Ala Pro Glu Val
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Ile Met Ser Gln His Tyr Asp Gly Lys Ala Asp Leu Trp Ser Ile Gly
195 200 205

Thr Ile Val Tyr Gln Cys Leu Thr Gly Lys Ala Pro Phe Gln Ala Ser
210 215 220

Ser Pro Gln Asp Leu Arg Leu Phe Tyr Glu Lys Asn Lys Thr Leu Val
225 230 235 240

Pro Thr Ile Pro Arg Glu Thr Ser Ala Pro Leu Arg Gln Leu Leu Leu
245 250 255

Ala Leu Leu Gln Arg Asn His Lys Asp Arg Met Asp Phe Asp Glu Phe
260 265 270

Phe His His Pro Phe Leu Asp Ala Ser Pro Ser Val Arg Lys Ser Pro
275 280 285

Pro Val Pro Val Pro Ser Tyr Pro Ser Ser Gly Ser Gly Ser Ser Ser
290 295 300

Ser Ser Ser Ser Thr Ser His Leu Ala Ser Pro Pro Ser Leu Gly Glu
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Met Gln Gln Leu Gln Lys Thr Leu Ala Ser Pro Ala Asp Thr Ala Gly
325 330 335

Phe Leu His Ser Ser Arg Asp Ser Gly Gly Ser Lys Asp Ser Ser Cys
340 345 350

Asp Thr Asp Asp Phe Val Met Val Pro Ala Gln Phe Pro Gly Asp Leu
355 360 365

Val Ala Glu Ala Pro Ser Ala Lys Pro Pro Pro Asp Ser Leu Met Cys
370 375 380

Ser Gly Ser Ser Leu Val Ala Ser Ala Gly Leu Glu Ser His Gly Arg
385 390 395 400

Thr Pro Ser Pro Ser Pro Pro Cys Ser Ser Ser Pro Ser Pro Ser Gly
405 410 415

Arg Ala Gly Pro Phe Ser Ser Ser Arg Cys Gly Ala Ser Val Pro Ile
420 425 430

Pro Val Pro Thr Gln Val Gln Asn Tyr Gln Arg Ile Glu Arg Asn Leu
435 440 445

Gln Ser Pro Thr Gln Phe Gln Thr Pro Arg Ser Ser Ala Ile Arg Arg
450 455 460

Ser Gly Ser Thr Ser Pro Leu Gly Phe Ala Arg Ala Ser Pro Ser Pro
465 470 475 480

Pro Ala His Ala Glu His Gly Gly Val Leu Ala Arg Lys Met Ser Leu
485 490 495

Gly Gly Gly Arg Pro Tyr Thr Pro Ser Pro Gln Val Gly Thr Ile Pro
500 505 510

Glu Arg Pro Gly Trp Ser Gly Thr Pro Ser Pro Gln Gly Ala Glu Met
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Arg Gly Gly Arg Ser Pro Arg Pro Gly Ser Ser Ala Pro Glu His Ser
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Pro Arg Thr Ser Gly Leu Gly Cys Arg Leu His Ser Ala Pro Asn Leu
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Ser Asp Leu His Val Val Arg Pro Lys Leu Pro Lys Pro Pro Thr Asp
565 570 575

Pro Leu Gly Ala Val Phe Ser Pro Pro Gln Ala Ser Pro Pro Gln Pro
580 585 590

Ser His Gly Leu Gln Ser Cys Arg Asn Leu Arg Gly Ser Pro Lys Leu
595 600 605

Pro Asp Phe Leu Gln Arg Asn Pro Leu Pro Pro Ile Leu Gly Ser Pro
610 615 620

Thr Lys Ala Val Pro Ser Phe Asp Phe Pro Lys Thr Pro Ser Ser Gln
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Asn Leu Leu Ala Leu Leu Ala Arg Gln Gly Val Val Met Thr Pro Pro
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Arg Asn Arg Thr Leu Pro Asp Leu Ser Glu Val Gly Pro Phe His Gly
660 665 670

Gln Pro Leu Gly Pro Gly Leu Arg Pro Gly Glu Asp Pro Lys Gly Pro
675 680 685

Phe Gly Arg Ser Phe Ser Thr Ser Arg Leu Thr Asp Leu Leu Leu Lys
690 695 700

Ala Ala Phe Gly Thr Gln Ala Pro Asp Pro Gly Ser Thr Glu Ser Leu
705 710 715 720

Gln Glu Lys Pro Met Glu Ile Ala Pro Ser Ala Gly Phe Gly Gly Ser
725 730 735

Leu His Pro Gly Ala Arg Ala Gly Gly Thr Ser Ser Pro Ser Pro Val
740 745 750

Val Phe Thr Val Gly Ser Pro Pro Ser Gly Ser Thr Pro Pro Gln Gly
755 760 765

Pro Arg Thr Arg Met Phe Ser Ala Gly Pro Thr Gly Ser Ala Ser Ser
770 775 780

Ser Ala Arg His Leu Val Pro Gly Pro Cys Ser Glu Ala Pro Ala Pro
785 790 795 800

Glu Leu Pro Ala Pro Gly His Gly Cys Ser Phe Ala Asp Pro Ile Ala
805 810 815

Ala Asn Leu Glu Gly Ala Val Thr Phe Glu Ala Pro Asp Leu Pro Glu
820 825 830

Glu Thr Leu Met Glu Gln Glu His Thr Glu Ile Leu Arg Gly Leu Arg
835 840 845

Phe Thr Leu Leu Phe Val Gln His Val Leu Glu Ile Ala Ala Leu Lys
850 855 860

Gly Ser Ala Ser Glu Ala Ala Gly Gly Pro Glu Tyr Gln Leu Gln Glu
865 870 875 880

Ser Val Val Ala Asp Gln Ile Ser Leu Leu Ser Arg Glu Trp Gly Phe
885 890 895

Ala Glu Gln Leu Val Leu Tyr Leu Lys Val Ala Glu Leu Leu Ser Ser
900 905 910

Gly Leu Gln Ser Ala Ile Asp Gln Ile Arg Ala Gly Lys Leu Cys Leu
915 920 925

Ser Ser Thr Val Lys Gln Val Val Arg Arg Leu Asn Glu Leu Tyr Lys
930 935 940

Ala Ser Val Val Ser Cys Gln Gly Leu Ser Leu Arg Leu Gln Arg Phe
945 950 955 960

Phe Leu Asp Lys Gln Arg Leu Leu Asp Arg Ile His Ser Ile Thr Ala
965 970 975

Glu Arg Leu Ile Phe Ser His Ala Val Gln Met Val Gln Ser Ala Ala
980 985 990

Leu Asp Glu Met Phe Gln His Arg Glu Gly Cys Val Pro Arg Tyr His
995 1000 1005

Lys Ala Leu Leu Leu Leu Glu Gly Leu Gln His Met Leu Ser Asp
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Ile Ala Asn Ser Gly Ser Ala Gly Leu Ile Asn Pro Ala Ala Thr Val
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Asn Asp Glu Ser Gly Arg Asp Ser Glu Val Ser Ala Arg Glu His Met
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Ser Ser Ser Ser Ser Leu Gln Ser Arg Glu Glu Lys Gln Glu Pro Val
85 90 95

Val Val Arg Pro Tyr Pro Gln Val Gln Met Leu Ser Thr His His Ala
100 105 110

Val Ala Ser Ala Thr Pro Val Ala Val Thr Ala Pro Pro Ala His Leu
115 120 125

Thr Pro Ala Val Pro Leu Ser Phe Ser Glu Gly Leu Met Lys Pro Pro
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Pro Lys Pro Thr Met Pro Ser Arg Pro Ile Ala Pro Ala Pro Pro Ser
145 150 155 160

Thr Leu Ser Leu Pro Pro Lys Val Pro Gly Gln Val Thr Val Thr Met
165 170 175

Glu Ser Ser Ile Pro Gln Ala Ser Ala Ile Pro Val Ala Thr Ile Ser
180 185 190

Gly Gln Gln Gly His Pro Ser Asn Leu His His Ile Met Thr Thr Asn
195 200 205

Val Gln Met Ser Ile Ile Arg Ser Asn Ala Pro Gly Pro Pro Leu His
210 215 220

Ile Gly Ala Ser His Leu Pro Arg Gly Ala Ala Ala Ala Val Met
225 230 235 240

Ser Ser Ser Lys Val Thr Thr Val Leu Arg Pro Thr Ser Gln Leu Pro
245 250 255

Asn Ala Ala Thr Ala Gln Pro Ala Val Gln His Ile Ile His Gln Pro
260 265 270

Ile Gln Ser Arg Pro Pro Val Thr Thr Ser Asn Ala Ile Pro Pro Ala
275 280 285

Val Val Ala Thr Val Ser Ala Thr Arg Ala Gln Ser Pro Val Ile Thr
290 295 300

Thr Thr Ala Ala His Ala Thr Asp Ser Ala Leu Ser Arg Pro Thr Leu
305 310 315 320

Ser Ile Gln His Pro Pro Ser Ala Ala Ile Ser Ile Gln Arg Pro Ala
325 330 335

Gln Ser Arg Asp Val Thr Thr Arg Ile Thr Leu Pro Ser His Pro Ala
340 345 350

Leu Gly Thr Pro Lys Gln Gln Leu His Thr Met Ala Gln Lys Thr Ile
355 360 365

Phe Ser Thr Gly Thr Pro Val Ala Ala Ala Thr Val Ala Pro Ile Leu
370 375 380

Ala Thr Asn Thr Ile Pro Ser Ala Thr Thr Ala Gly Ser Val Ser His
385 390 395 400

Thr Gln Ala Pro Thr Ser Thr Ile Val Thr Met Thr Val Pro Ser His
405 410 415

Ser Ser His Ala Thr Ala Val Thr Thr Ser Asn Ile Pro Val Ala Lys
420 425 430

Val Val Pro Gln Gln Ile Thr His Thr Ser Pro Arg Ile Gln Pro Asp
435 440 445

Tyr Pro Ala Glu Arg Ser Ser Leu Ile Pro Ile Ser Gly His Arg Ala
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Ser Pro Asn Pro Val Ala Met Glu Thr Arg Ser Asp Asn Arg Pro Ser
465 470 475 480

Val Pro Val Gln Phe Gln Tyr Phe Leu Pro Thr Tyr Pro Pro Ser Ala
485 490 495

Tyr Pro Leu Ala Ala His Thr Tyr Thr Pro Ile Thr Ser Ser Val Ser
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Thr Ile Arg Gln Tyr Pro Val Ser Ala Gln Ala Pro Asn Ser Ala Ile
515 520 525

Thr Ala Gln Thr Gly Val Gly Val Ala Ser Thr Val His Leu Asn Pro
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Met Gln Leu Met Thr Val Asp Ala Ser His Ala Arg His Ile Gln Gly
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Ile Gln Pro Ala Pro Ile Ser Thr Gln Gly Ile Gln Pro Ala Pro Ile
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Gly Thr Pro Gly Ile Gln Pro Ala Pro Leu Gly Thr Gln Gly Ile His
580 585 590

Ser Ala Thr Pro Ile Asn Thr Gln Gly Leu Gln Pro Ala Pro Met Gly
595 600 605

Thr Gln Gln Pro Gln Pro Glu Gly Lys Thr Ser Ala Val Val Leu Ala
610 615 620

Asp Gly Ala Thr Ile Val Ala Asn Pro Ile Ser Asn Pro Phe Ser Ala
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Ala Pro Ala Ala Thr Thr Val Val Gln Thr His Ser Gln Ser Ala Ser
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Thr Asn Ala Pro Ala Gln Gly Ser Ser Pro Arg Pro Ser Ile Leu Arg
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Lys Lys Pro Ala Thr Asp Gly Met Ala Val Arg Lys Thr Leu Ile Pro
675 680 685

Pro Gln Pro Pro Asp Val Ala Ser Pro Arg Val Glu Ser Ser Met Arg
690 695 700

Ser Thr Ser Gly Ser Pro Arg Pro Ala Gly Ala Lys Pro Lys Ser Glu
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Ile His Val Ser Met Ala Thr Pro Val Thr Val Ser Met Glu Thr Val
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Ser Asn Gln Asn Asn Asp Gln Pro Thr Ile Ala Val Pro Pro Thr Ala
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Gln Gln Pro Pro Pro Thr Ile Pro Thr Met Ile Ala Ala Ala Ser Pro
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Pro Ser Gln Pro Ala Val Ala Leu Ser Thr Ile Pro Gly Ala Val Pro

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775

780

Ile Thr Pro Pro Ile Thr Thr Ile Ala Ala Ala Pro Pro Pro Ser Val
785 790 795 800

Thr Val Gly Gly Ser Leu Ser Ser Val Leu Gly Pro Pro Val Pro Glu
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Ile Lys Val Lys Glu Glu Val Glu Pro Met Asp Ile Met Arg Pro Val
820 825 830

Ser Ala Val Pro Pro Leu Ala Thr Asn Thr Val Ser Pro Ser Leu Ala
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Leu Leu Ala Asn Asn Leu Ser Met Pro Thr Ser Asp Leu Pro Pro Gly
850 855 860

Ala Ser Pro Arg Lys Lys Pro Arg Lys Gln Gln His Val Ile Ser Thr
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Glu Glu Gly Asp Met Met Glu Thr Asn Ser Thr Asp Asp Glu Lys Ser
885 890 895

Thr Ala Lys Ser Leu Leu Val Lys Ala Glu Lys Arg Lys Ser Pro Pro
900 905 910

Lys Glu Tyr Ile Asp Glu Glu Gly Val Arg Tyr Val Pro Val Arg Pro
915 920 925

Arg Pro Pro Ile Thr Leu Leu Arg His Tyr Arg Asn Pro Trp Lys Ala
930 935 940

Ala Tyr His His Phe Gln Arg Tyr Ser Asp Val Arg Val Lys Glu Glu
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Lys Lys Ala Met Leu Gln Glu Ile Ala Asn Gln Lys Gly Val Ser Cys
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Arg Ala Gln Gly Trp Lys Val His Leu Cys Ala Ala Gln Leu Leu Gln
980 985 990

Leu Thr Asn Leu Glu His Asp Val Tyr Glu Arg Leu Thr Asn Leu Gln
995 1000 1005

Glu Gly Ile Ile Pro Lys Lys Lys Ala Ala Thr Asp Asp Asp Leu
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His Arg Ile Asn Glu Leu Ile Gln Gly Asn Met Gln Arg Cys Lys
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Leu Val Met Asp Gln Ile Ser Glu Ala Arg Asp Ser Met Leu Lys
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Gly Thr Val Lys Lys Val Ser Lys Leu Lys Arg Lys Glu Lys Val
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<212> PRT
<213> Homo sapiens

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<223> Xaa can be any naturally occurring amino acid

<400> 22

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Thr Thr Ser Gln Ile Met Ala Arg Lys Lys Arg Arg Gly Ile Ile Glu	35	40	45
Lys Arg Arg Arg Asp Arg Ile Asn Asn Ser Leu Ser Glu Leu Arg Arg	50	55	60
Leu Val Pro Thr Ala Phe Glu Lys Gln Gly Ser Ala Lys Leu Glu Lys	65	70	75
Ala Glu Ile Leu Gln Met Thr Val Asp His Leu Lys Met Leu Gln Ala	85	90	95
Thr Gly Gly Lys Gly Tyr Phe Asp Ala His Ala Leu Ala Met Asp Phe	100	105	110
Met Ser Ile Gly Phe Arg Glu Cys Leu Thr Glu Val Ala Arg Tyr Leu	115	120	125
Ser Ser Val Glu Gly Leu Asp Ser Ser Asp Pro Leu Arg Val Arg Leu	130	135	140
Val Ser His Leu Ser Thr Cys Ala Thr Gln Arg Glu Ala Ala Ala Met	145	150	155
Thr Ser Ser Met Ala His His His His Pro Leu His Pro His His Trp	165	170	175
Ala Ala Ala Phe His His Leu Pro Ala Ala Leu Leu Gln Pro Asn Gly	180	185	190
Leu His Ala Ser Glu Ser Thr Pro Cys Arg Leu Ser Thr Thr Ser Glu	195	200	205
Val Pro Pro Ala His Gly Ser Ala Leu Leu Thr Ala Thr Phe Ala His	210	215	220
Ala Asp Ser Ala Leu Arg Met Pro Ser Thr Gly Ser Val Ala Pro Cys	225	230	235
			240

Val Pro Pro Leu Ser Thr Ser Leu Leu Ser Leu Ser Ala Thr Val His
245 250 255

Ala Ala Ala Ala Ala Ala Thr Ala Ala Ala His Ser Phe Pro Leu Ser
260 265 270

Phe Ala Gly Ala Phe Pro Met Leu Pro Pro Asn Ala Ala Ala Val
275 280 285

Ala Ala Ala Thr Ala Ile Ser Pro Pro Leu Ser Val Ser Ala Thr Ser
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Ser Pro Gln Gln Thr Ser Ser Gly Thr Asn Asn Lys Pro Tyr Arg Pro
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Trp Gly Thr Glu Val Gly Ala Phe
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<211> 1935
<212> DNA
<213> Homo sapiens

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 <211> 317
 <212> PRT
 <213> Homo sapiens

<400> 24

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			20				25					30			

Lys Phe Ser Asn Gln Glu Thr Cys Val Glu Ile Gly Glu Ser Val Arg
35 40 45

Gly Glu Asp Val Tyr Ile Val Gln Ser Gly Cys Gly Glu Ile Asn Asp
50 55 60

Asn Leu Met Glu Leu Leu Ile Met Ile Asn Ala Cys Lys Ile Ala Ser
65 70 75 80

Ala Ser Arg Val Thr Ala Val Ile Pro Cys Phe Pro Tyr Ala Arg Gln
85 90 95

Asp Lys Lys Asp Lys Ser Arg Ala Pro Ile Ser Ala Lys Leu Val Ala
100 105 110

Asn Met Leu Ser Val Ala Gly Ala Asp His Ile Ile Thr Met Asp Leu
115 120 125

His Ala Ser Gln Ile Gln Gly Phe Phe Asp Ile Pro Val Asp Asn Leu
130 135 140

Tyr Ala Glu Pro Ala Val Leu Lys Trp Ile Arg Glu Asn Ile Ser Glu
145 150 155 160

Trp Arg Asn Cys Thr Ile Val Ser Pro Asp Ala Gly Gly Ala Lys Arg
165 170 175

Val Thr Ser Ile Ala Asp Arg Leu Asn Val Asp Phe Ala Leu Ile His
180 185 190

Lys Glu Arg Lys Lys Ala Asn Glu Val Asp Arg Met Val Leu Val Gly
195 200 205

Asp Val Lys Asp Arg Val Ala Ile Leu Val Asp Asp Met Ala Asp Thr
210 215 220

Cys Gly Thr Ile Cys His Ala Ala Asp Lys Leu Leu Ser Ala Gly Ala
225 230 235 240

Thr Arg Val Tyr Ala Ile Leu Thr His Gly Ile Phe Ser Gly Pro Ala
245 250 255

Ile Ser Arg Ile Asn Asn Ala Cys Phe Glu Ala Val Val Val Thr Asn

260

265

270

Thr Ile Pro Gln Glu Asp Lys Met Lys His Cys Ser Lys Ile Gln Val
 275 280 285

Ile Asp Ile Ser Met Ile Leu Ala Glu Ala Ile Arg Arg Thr His Asn
 290 295 300

Gly Glu Ser Val Ser Tyr Leu Phe Ser His Val Pro Leu
 305 310 315

<210> 25
 <211> 1054
 <212> DNA
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<211> 200
<212> PRT
<213> Homo sapiens

<400> 26

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20 25 30

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35 40 45

Thr Pro Tyr Glu Gly Gly Arg Tyr Gln Leu Glu Ile Lys Ile Pro Glu
50 55 60

Thr Tyr Pro Phe Asn Pro Pro Lys Val Arg Phe Ile Thr Lys Ile Trp
65 70 75 80

His Pro Asn Ile Ser Ser Val Thr Gly Ala Ile Cys Leu Asp Ile Leu
85 90 95

Lys Asp Gln Trp Ala Ala Ala Met Thr Leu Arg Thr Val Leu Leu Ser
100 105 110

Leu Gln Ala Leu Leu Ala Ala Ala Glu Pro Asp Asp Pro Gln Asp Ala
115 120 125

Val Val Ala Asn Gln Tyr Lys Gln Asn Pro Glu Met Phe Lys Gln Thr
130 135 140

Ala Arg Leu Trp Ala His Val Tyr Ala Gly Ala Pro Val Ser Ser Pro
145 150 155 160

Glu Tyr Thr Lys Lys Ile Glu Asn Leu Cys Ala Met Gly Phe Asp Arg
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Ala Thr Glu Leu Leu Leu Ser Asn

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35 40 45

Ser Gly Ala Pro Val Trp Glu Leu Pro Gly Cys Phe Ser Lys Gln Arg
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His Tyr Phe Ala Phe Pro Pro Ala Val Cys Glu Asn Ser Asn Phe Ser
65 70 75 80

Ile Ser Leu Thr Thr Leu Ala Ile Cys Thr Phe Val Ile Ser His Pro
85 90 95

Gly Gly Tyr Glu Val Val Ser His Trp Asn Phe Asp Phe His Phe Pro
100 105 110

Asp Asp His Cys Lys Ser Phe Lys Ile Tyr Ser Leu Gly Arg Ala Cys
115 120 125

Trp Leu Met Pro Val Ile Pro Ala Leu Trp Glu Asp Glu Ala Gly Gly
130 135 140

Ser Pro Ala Val Gln Glu Phe Arg Thr Ser Leu Thr Asn Lys Leu Leu
145 150 155 160

His Val Ala Ser Glu Ser Tyr Ala Val Lys Arg Phe Lys Gln Phe Phe
165 170 175

Cys Leu Ser Leu Pro Ser Ser Trp Asp Tyr Ser Phe Gln Lys Lys Thr
180 185 190

Tyr Ser Lys Met Asn Asn Pro Ala Ile Lys Arg Ile Gly Asn His Ile
195 200 205

Thr Lys Ser Pro Glu Asp Lys Arg Glu Tyr Arg Gly Leu Glu Leu Ala
210 215 220

Asn Gly Ile Lys Val Leu Leu Ile Ser Asp Pro Thr Thr Asp Lys Ser
225 230 235 240

Ser Ala Ala Leu Asp Val His Ile Gly Ser Leu Ser Asp Pro Pro Asn
245 250 255

Ile Ala Gly Leu Ser His Phe Cys Glu His Met Leu Phe Leu Gly Thr
260 265 270

Lys Lys Tyr Pro Lys Glu Asn Glu Tyr Ser Gln Phe Leu Ser Glu His
275 280 285

Ala Gly Ser Ser Asn Ala Phe Thr Ser Gly Glu His Thr Asn Tyr Tyr
290 295 300

Phe Asp Val Ser His Glu His Leu Glu Gly Ala Leu Asp Arg Phe Ala
305 310 315 320

Gln Phe Phe Leu Cys Pro Leu Phe Asp Glu Ser Cys Lys Asp Arg Glu
325 330 335

Val Asn Ala Val Asp Ser Glu His Glu Lys Asn Val Met Asn Asp Ala
340 345 350

Trp Arg Leu Phe Gln Leu Glu Lys Ala Thr Gly Asn Pro Lys His Pro
355 360 365

Phe Ser Lys Phe Gly Thr Gly Asn Lys Tyr Thr Leu Glu Thr Arg Pro
370 375 380

Asn Gln Glu Gly Ile Asp Val Arg Gln Glu Leu Leu Lys Phe His Ser
385 390 395 400

Ala Tyr Tyr Ser Ser Asn Leu Met Ala Val Cys Val Leu Gly Arg Glu
405 410 415

Ser Leu Asp Asp Leu Thr Asn Leu Val Val Lys Leu Phe Ser Glu Val
420 425 430

Glu Asn Lys Asn Val Pro Leu Pro Glu Phe Pro Glu His Pro Phe Gln
435 440 445

Glu Glu His Leu Lys Gln Leu Tyr Lys Ile Val Pro Ile Lys Asp Ile
450 455 460

Arg Asn Leu Tyr Val Thr Phe Pro Ile Pro Asp Leu Gln Lys Tyr Tyr
465 470 475 480

Lys Ser Asn Pro Gly His Tyr Leu Gly His Leu Ile Gly His Glu Gly
485 490 495

Pro Gly Ser Leu Leu Ser Glu Leu Lys Ser Lys Gly Trp Val Asn Thr
500 505 510

Leu Val Gly Gly Gln Lys Glu Gly Ala Arg Gly Phe Met Phe Phe Ile
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Ile Asn Val Asp Leu Thr Glu Glu Gly Leu Leu His Val Glu Asp Ile

530

535

540

Ile Leu His Met Phe Gln Tyr Ile Gln Lys Leu Arg Ala Glu Gly Pro
 545 550 555 560

Gln Glu Trp Val Phe Gln Glu Cys Lys Asp Leu Asn Ala Val Ala Phe
 565 570 575

Arg Phe Lys Asp Lys Glu Arg Pro Arg Gly Tyr Thr Ser Lys Ile Ala
 580 585 590

Gly Ile Leu His Tyr Tyr Pro Leu Glu Glu Val Leu Thr Ala Glu Tyr
 595 600 605

Leu Leu Glu Glu Phe Arg Pro Asp Leu Ile Glu Met Val Leu Asp Lys
 610 615 620

Leu Arg Pro Glu Asn Val Arg Val Ala Ile Val Ser Lys Ser Phe Glu
 625 630 635 640

Gly Lys Thr Asp Arg Thr Glu Glu Trp Tyr Gly Thr Gln Tyr Lys Gln
 645 650 655

Glu Ala Ile Pro Asp Glu Val Ile Lys Lys Trp Gln Asn Ala Asp Leu
 660 665 670

Asn Gly Lys Phe Lys Leu Pro Thr Lys Asn Glu Phe Ile Pro Thr Asn
 675 680 685

Phe Glu Ile Leu Pro Leu Glu Lys Glu Ala Thr Pro Tyr Pro Ala Leu
 690 695 700

Ile Lys Asp Thr Ala Met Ser Lys Leu Trp Phe Lys Gln Asp Asp Lys
 705 710 715 720

Phe Phe Leu Pro Lys Ala Cys Leu Asn Phe Glu Phe Phe Ser Pro Phe
 725 730 735

Ala Tyr Val Asp Pro Leu His Cys Asn Met Ala Tyr Leu Tyr Leu Glu
 740 745 750

Leu Leu Lys Asp Ser Leu Asn Glu Tyr Ala Tyr Ala Ala Glu Leu Ala
 755 760 765

Gly Leu Ser Tyr Asp Leu Gln Asn Thr Ile Tyr Gly Met Tyr Leu Ser
770 775 780

Val Lys Gly Tyr Asn Asp Lys Gln Pro Ile Leu Leu Lys Lys Ile Ile
785 790 795 800

Glu Lys Met Ala Thr Phe Glu Ile Asp Glu Lys Arg Phe Glu Ile Ile
805 810 815

Lys Glu Ala Tyr Met Arg Ser Leu Asn Asn Phe Arg Ala Glu Gln Pro
820 825 830

His Gln His Ala Met Tyr Tyr Leu Arg Leu Leu Met Thr Glu Val Ala
835 840 845

Trp Thr Lys Asp Glu Leu Lys Glu Ala Leu Asp Asp Val Thr Leu Pro
850 855 860

Arg Leu Lys Ala Phe Ile Pro Gln Leu Leu Ser Arg Leu His Ile Glu
865 870 875 880

Ala Leu Leu His Gly Asn Ile Thr Lys Gln Ala Ala Leu Gly Ile Met
885 890 895

Gln Met Val Glu Asp Thr Leu Ile Glu His Ala His Thr Lys Pro Leu
900 905 910

Leu Pro Ser Gln Leu Val Arg Tyr Arg Glu Val Gln Leu Pro Asp Arg
915 920 925

Gly Trp Phe Val Tyr Gln Gln Arg Asn Glu Val His Asn Asn Cys Gly
930 935 940

Ile Glu Ile Tyr Tyr Gln Thr Asp Met Gln Ser Thr Ser Glu Asn Met
945 950 955 960

Phe Leu Glu Leu Phe Cys Gln Ile Ile Ser Glu Pro Cys Phe Asn Thr
965 970 975

Leu Arg Thr Lys Glu Gln Leu Gly Tyr Ile Val Phe Ser Gly Pro Arg
980 985 990

Arg Ala Asn Gly Ile Gln Gly Leu Arg Phe Ile Ile Gln Ser Glu Lys
995 1000 1005

Pro Pro His Tyr Leu Glu Ser Arg Val Glu Ala Phe Leu Ile Thr
1010 1015 1020

Met Glu Lys Ser Ile Glu Asp Met Thr Glu Glu Ala Phe Gln Lys
1025 1030 1035

His Ile Gln Ala Leu Ala Ile Arg Arg Leu Asp Lys Pro Lys Lys
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Leu Ser Ala Glu Cys Ala Lys Tyr Trp Gly Glu Ile Ile Ser Gln
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Gln Tyr Asn Phe Asp Arg Asp Asn Thr Glu Val Ala Tyr Leu Lys
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Thr Leu Thr Lys Glu Asp Ile Ile Lys Phe Tyr Lys Glu Met Leu
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Ala Val Asp Ala Pro Arg Arg His Lys Val Ser Val His Val Leu
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Ala Arg Glu Met Asp Ser Cys Pro Val Val Gly Glu Phe Pro Cys
1115 1120 1125

Gln Asn Asp Ile Asn Leu Ser Gln Ala Pro Ala Leu Pro Gln Pro
1130 1135 1140

Glu Val Ile Gln Asn Met Thr Glu Phe Lys Arg Gly Leu Pro Leu
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<212> DNA
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<400> 30

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Lys Lys Glu Lys Glu Lys Lys Ala Glu Asp Leu Asp Phe Trp Leu Ser

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Thr Thr Pro Pro Pro Ala Pro Ala Pro Ala Pro Ala Pro Val Pro Ser
35 40 45

Thr Gly Glu Leu Ser Val Asn Thr Val Thr Thr Pro Lys Asp Glu Cys
50 55 60

Glu Asp Ala Lys Thr Glu Ala Gln Gly Glu Glu Asp Asp Ala Glu Gly
65 70 75 80

Gln Asp Gln Asp Lys Lys Ser Pro Lys Pro Lys Lys Lys Lys His Arg
85 90 95

Lys Glu Lys Glu Glu Arg Thr Lys Gly Lys Lys Lys Ser Lys Lys Gln
100 105 110

Pro Pro Gly Gln Glu Glu Glu Gln Leu Pro Pro Glu Ser Ser Tyr Ser
115 120 125

Leu Leu Ala Glu Asn Ser Tyr Val Lys Met Thr Cys Asp Ile Arg Gly
130 135 140

Ser Leu Gln Glu Asp Ser Gln Val Thr Val Ala Ile Val Leu Glu Asn
145 150 155 160

Arg Ser Ser Ser Ile Leu Lys Gly Met Glu Leu Ser Val Leu Asp Ser
165 170 175

Leu Asn Ala Arg Met Ala Arg Pro Gln Gly Ser Ser Val His Asp Gly
180 185 190

Val Pro Val Pro Phe Gln Leu Pro Pro Gly Val Ser Asn Glu Ala Gln
195 200 205

Tyr Val Phe Thr Ile Gln Ser Ile Val Met Ala Gln Lys Leu Lys Gly
210 215 220

Thr Leu Ser Phe Ile Ala Lys Asn Asp Glu Gly Ala Thr His Glu Lys
225 230 235 240

Leu Asp Phe Arg Leu His Phe Ser Cys Ser Ser Tyr Leu Ile Thr Thr
245 250 255

Pro Cys Tyr Ser Asp Ala Phe Ala Lys Leu Leu Glu Ser Gly Asp Leu
260 265 270

Ser Met Ser Ser Ile Lys Val Asp Gly Ile Arg Met Ser Phe Gln Asn
275 280 285

Leu Leu Ala Lys Ile Cys Phe His His His Phe Ser Val Val Glu Arg
290 295 300

Val Asp Ser Cys Ala Ser Met Tyr Ser Arg Ser Ile Gln Gly His His
305 310 315 320

Val Cys Leu Leu Val Lys Lys Gly Glu Asn Ser Val Ser Val Asp Gly
325 330 335

Lys Cys Ser Asp Ser Thr Leu Leu Ser Asn Leu Leu Glu Glu Met Lys
340 345 350

Ala Thr Leu Ala Lys Cys Val Arg Ala Ala Cys Glu Pro Arg Thr Thr
355 360 365

Pro Arg Ser Thr Tyr Pro Gly Thr Ala Ala Leu Thr Cys Leu Ala Ser
370 375 380

Pro Gln Ser Cys Val Leu Tyr Pro Ser Leu Ser Val Asn Leu Thr Leu
385 390 395 400

Cys Cys Pro Pro Cys Arg His Pro Arg Ser Phe Val Ala Leu Asn Tyr
405 410 415

Leu Thr Ile Leu Phe Tyr Cys Asp Ser Ser His Ser Leu Trp Gln Glu
420 425 430

Val Pro Phe Ser Pro Pro Asn Gln Gln Gly Thr Pro Pro Pro Gly Ser
435 440 445

Val Pro Cys Pro Ala Leu Gly Ala Glu Ser Leu Asn Val Ala Ser Gly
450 455 460

Ala Pro Val Leu Thr Val Ala Ser Gly Gly Gly Glu Gly Arg Ala Ala
465 470 475 480

Val Ala Lys Val Phe Ser Pro Arg Thr Pro Trp Ala Ala Ala Met Ala
485 490 495

Leu Lys Met Val Lys Gly Ser Ile Asp Arg Met Phe Asp Lys Asn Leu
500 505 510

Gln Asp Leu Val Arg Gly Ile Arg Asn His Lys Glu Asp Glu Ala Lys
515 520 525

Tyr Ile Ser Gln Cys Ile Asp Glu Ile Lys Gln Glu Leu Lys Gln Asp
530 535 540

Asn Ile Ala Val Lys Ala Asn Ala Val Cys Lys Leu Thr Tyr Leu Gln
545 550 555 560

Met Leu Gly Tyr Asp Ile Ser Trp Ala Ala Phe Asn Ile Ile Glu Val
565 570 575

Met Ser Ala Ser Lys Phe Thr Phe Lys Arg Ile Gly Tyr Leu Ala Ala
580 585 590

Ser Gln Ser Phe His Glu Gly Thr Asp Val Ile Met Leu Thr Thr Asn
595 600 605

Gln Ile Arg Lys Asp Leu Ser Ser Pro Ser Gln Tyr Asp Thr Gly Val
610 615 620

Ala Leu Thr Gly Leu Ser Cys Phe Val Thr Pro Asp Leu Ala Arg Asp
625 630 635 640

Leu Ala Asn Asp Ile Met Thr Leu Met Ser His Thr Lys Pro Tyr Ile
645 650 655

Arg Lys Lys Ala Val Leu Ile Met Tyr Lys Val Phe Leu Lys Tyr Pro
660 665 670

Glu Ser Leu Arg Pro Ala Phe Pro Arg Leu Lys Glu Lys Leu Glu Asp
675 680 685

Pro Asp Pro Gly Val Gln Ser Ala Ala Val Asn Val Ile Cys Glu Leu
690 695 700

Ala Arg Arg Asn Pro Lys Asn Tyr Leu Ser Leu Ala Pro Leu Phe Phe
705 710 715 720

Lys Leu Met Thr Ser Ser Thr Asn Asn Trp Val Leu Ile Lys Ile Ile
725 730 735

Lys Leu Phe Gly Ala Leu Thr Pro Leu Glu Pro Arg Leu Gly Lys Lys
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Leu Ile Glu Pro Leu Thr Asn Leu Ile His Ser Thr Ser Ala Met Ser
755 760 765

Leu Leu Tyr Glu Cys Val Asn Thr Val Ile Ala Val Leu Ile Ser Leu
770 775 780

Ser Ser Gly Met Pro Asn His Ser Ala Ser Ile Gln Leu Cys Val Gln
785 790 795 800

Lys Leu Arg Ile Leu Ile Glu Asp Ser Asp Gln Asn Leu Lys Tyr Leu
805 810 815

Gly Leu Leu Ala Met Ser Lys Ile Leu Lys Thr His Pro Lys Ser Val
820 825 830

Gln Ser His Lys Asp Leu Ile Leu Gln Cys Leu Asp Asp Lys Asp Glu
835 840 845

Ser Ile Arg Leu Arg Ala Leu Asp Leu Leu Tyr Gly Met Val Ser Lys
850 855 860

Lys Asn Leu Met Glu Ile Val Lys Lys Leu Met Thr His Val Asp Lys
865 870 875 880

Ala Glu Gly Thr Thr Tyr Arg Asp Glu Leu Leu Thr Lys Ile Ile Asp
885 890 895

Ile Cys Ser Gln Ser Asn Tyr Gln Tyr Ile Thr Asn Phe Glu Trp Tyr
900 905 910

Ile Ser Ile Leu Val Glu Leu Thr Arg Leu Glu Gly Thr Arg His Gly
915 920 925

His Leu Ile Ala Ala Gln Met Leu Asp Val Ala Ile Arg Val Lys Ala

930

935

940

Ile Arg Lys Phe Ala Val Ser Gln Met Ser Ala Leu Leu Asp Ser Ala
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His Leu Leu Ala Ser Ser Thr Gln Arg Asn Gly Ile Cys Glu Val Leu
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Tyr Ala Ala Ala Trp Ile Cys Gly Glu Phe Ser Glu His Leu Gln Glu
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Pro His His Thr Leu Glu Ala Met Leu Arg Pro Arg Val Thr Thr Leu
 995 1000 1005

Pro Gly His Ile Gln Ala Val Tyr Val Gln Asn Val Val Lys Leu
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Tyr Ala Ser Ile Leu Gln Gln Lys Glu Gln Ala Gly Glu Ala Glu
 1025 1030 1035

Gly Ala Gln Ala Val Thr Gln Leu Met Val Asp Arg Leu Pro Gln
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Phe Val Gln Ser Ala Asp Leu Glu Val Gln Glu Arg Ala Ser Cys
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Ile Leu Gln Leu Val Lys His Ile Gln Lys Leu Gln Ala Lys Asp
 1070 1075 1080

Val Pro Val Ala Glu Glu Val Ser Ala Leu Phe Ala Gly Glu Leu
 1085 1090 1095

Asn Pro Val Ala Pro Lys Ala Gln Lys Lys Val Pro Val Pro Glu
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Gly Leu Asp Leu Asp Ala Trp Ile Asn Glu Pro Leu Ser Asp Ser
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Glu Ser Glu Asp Glu Arg Pro Arg Ala Val Phe His Glu Glu Glu
 1130 1135 1140

Gln Arg Arg Pro Lys His Arg Pro Ser Glu Ala Asp Glu Glu Glu
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Leu Ala Arg Arg Arg Glu Ala Arg Lys Gln Glu Gln Ala Asn Asn
1160 1165 1170

Pro Phe Tyr Ile Lys Ser Ser Pro Ser Pro Gln Lys Arg Tyr Gln
1175 1180 1185

Asp Thr Pro Gly Val Glu His Ile Pro Val Val Gln Ile Asp Leu
1190 1195 1200

Ser Val Pro Leu Lys Val Pro Gly Leu Pro Met Ser Asp Gln Tyr
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Val Lys Leu Glu Glu Glu Arg Arg His Arg Gln Lys Leu Glu Lys
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Asp Lys Arg Arg Lys Lys Arg Lys Glu Lys Glu Lys Lys Gly Lys
1235 1240 1245

Arg Arg His Ser Ser Leu Pro Thr Glu Ser Asp Glu Asp Ile Ala
1250 1255 1260

Pro Ala Gln Gln Val Asp Ile Val Thr Glu Glu Met Pro Glu Asn
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Ala Leu Pro Ser Asp Glu Asp Asp Lys Asp Pro Asn Asp Pro Tyr
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Arg Ala Leu Asp Ile Asp Leu Asp Lys Pro Leu Ala Asp Ser Glu
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Lys Leu Pro Ile Gln Lys His Arg Asn Thr Glu Thr Ser Lys Ser
1310 1315 1320

Pro Glu Lys Asp Val Pro Met Val Glu Lys Lys Ser Lys Lys Pro
1325 1330 1335

Lys Lys Lys Glu Lys Lys His Lys Glu Lys Glu Arg Asp Lys Glu
1340 1345 1350

Lys Lys Lys Glu Lys Glu Lys Lys Leu Arg Thr Trp Thr Ser Gly
1355 1360 1365

Phe Tyr	His Pro Gly Ile Pro	Glu Ala Arg Trp Thr	Arg Asp Leu
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Lys Asp	Gly Lys Glu Ile Asp	Ala Leu Asp Lys Ser	Thr Glu Arg
1385	1390	1395	
Glu His	Gly Val Arg Asn Glu	Gly Ser His Gly Ser	Arg Arg Pro
1400	1405	1410	
Leu Asn	Asp Leu Asp Val Ser	Glu Leu Gly Gln His	Arg Arg Tyr
1415	1420	1425	
Asp Asn	Asp Asp Ile Ile Glu	Trp Lys Pro Lys Pro	His Asn Lys
1430	1435	1440	
Glu Pro	Asn Gly Trp Gly Thr	His Thr Glu Ile Gly	Glu Tyr Ala
1445	1450	1455	
Tyr Thr	Ala Ala Leu Met Pro	Gln Thr Arg Ala Ala	Asn His Ser
1460	1465	1470	
Lys Lys	Gly Lys Asp Lys Asn	Glu Arg Pro Thr Arg	Asn Val Arg
1475	1480	1485	
His Lys	Arg Ala Arg Asn Arg	Gly Asp His Thr His	Thr Val Pro
1490	1495	1500	
Glu Ile	Gly Glu Asn Arg Lys	His Gln Asp Pro Glu	Lys Thr Gln
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Ala Ser	Arg Arg Lys Glu Gly	Ser Thr Thr Arg Gln	Thr Arg Gly
1520	1525	1530	
Gln Leu	Thr Arg Tyr Ile Ile	Pro Lys Arg Asp Lys	Gly Gly Ala
1535	1540	1545	
Ser Ser	Met Ile Glu His Glu	Arg Pro His Glu Glu	Tyr Ala Ala
1550	1555	1560	
Thr Pro	Gly Thr Val Ala Ala	Glu Tyr Ala Ile Arg	Val Glu Ala
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Gly Gln Arg Tyr Ser Arg Glu Thr Ser Glu Gly
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<212> PRT
<213> Homo sapiens

<400> 32

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Asp Ala Ser Val Asn Phe Ser Glu Phe Ser Lys Lys Cys Ser Glu Arg
35 40 45

Trp Lys Thr Met Ser Ala Lys Glu Lys Gly Lys Phe Glu Asp Met Ala
50 55 60

Lys Ala Asp Lys Ala Arg Tyr Glu Arg Glu Met Lys Thr Tyr Ile Pro
65 70 75 80

Pro Lys Gly Glu Thr Lys Lys Lys Phe Lys Asp Pro Asn Ala Pro Lys
85 90 95

Arg Pro Pro Ser Ala Phe Phe Leu Phe Cys Ser Glu Tyr Arg Pro Lys
100 105 110

Ile Lys Gly Glu His Pro Gly Leu Ser Ile Gly Asp Val Ala Lys Lys

115

120

125

Leu Gly Glu Met Trp Asn Asn Thr Ala Ala Asp Asp Lys Gln Pro Tyr
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Glu Lys Lys Ala Ala Lys Leu Lys Glu Lys Tyr Glu Lys Asp Ile Ala
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Ala Tyr Arg Ala Lys Gly Lys Pro Asp Ala Ala Lys Lys Gly Val Val
 165 170 175

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Glu Glu Asp Asp Asp Asp Glu
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<210> 33
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<211> 474
<212> PRT
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<400> 34

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Gly Ile Arg Lys Cys Gly Pro Arg Arg Arg Arg Arg Arg Arg Arg Arg
20 25 30

Arg Thr Gly Ala Gln Ala Gly Gly Pro Gly Pro Pro Ala Pro Glu Arg
35 40 45

Arg Asn Gly Arg Met Gln Gln Pro Gln Pro Gln Gly Gln Gln Gln Pro
50 55 60

Gly Pro Gly Gln Gln Leu Gly Gly Gln Gly Ala Ala Pro Gly Ala Gly

65

70

75

80

Gly Gly Pro Gly Gly Gly Pro Gly Pro Gly Pro Cys Leu Arg Arg Glu
85 90 95

Leu Lys Leu Leu Glu Ser Ile Phe His Arg Gly His Glu Arg Phe Arg
100 105 110

Ile Ala Ser Ala Cys Leu Asp Glu Leu Ser Cys Glu Phe Leu Leu Ala
115 120 125

Gly Ala Gly Gly Ala Gly Ala Gly Ala Ala Pro Gly Pro His Leu Pro
130 135 140

Pro Arg Gly Ser Val Pro Gly Asp Pro Val Arg Ile His Cys Asn Ile
145 150 155 160

Thr Glu Ser Tyr Pro Ala Val Pro Pro Ile Trp Ser Val Glu Ser Asp
165 170 175

Asp Pro Asn Leu Ala Ala Val Leu Glu Arg Leu Val Asp Ile Lys Lys
180 185 190

Gly Asn Thr Leu Leu Leu Gln His Leu Lys Arg Ile Ile Ser Asp Leu
195 200 205

Cys Lys Leu Tyr Asn Leu Pro Gln His Pro Asp Val Glu Met Leu Asp
210 215 220

Gln Pro Leu Pro Ala Glu Gln Cys Thr Gln Glu Asp Val Ser Ser Glu
225 230 235 240

Asp Glu Asp Glu Glu Met Pro Glu Asp Thr Glu Asp Leu Asp His Tyr
245 250 255

Glu Met Lys Glu Glu Glu Pro Ala Glu Gly Lys Lys Ser Glu Asp Asp
260 265 270

Gly Ile Gly Lys Glu Asn Leu Ala Ile Leu Glu Lys Ile Lys Lys Asn
275 280 285

Gln Arg Gln Asp Tyr Leu Asn Gly Ala Val Ser Gly Ser Val Gln Ala
290 295 300

Thr Asp Arg Leu Met Lys Glu Leu Arg Asp Ile Tyr Arg Ser Gln Ser
 305 310 315 320

Phe Lys Gly Gly Asn Tyr Ala Val Glu Leu Val Asn Asp Ser Leu Tyr
 325 330 335

Asp Trp Asn Val Lys Leu Leu Lys Val Asp Gln Asp Ser Ala Leu His
 340 345 350

Asn Asp Leu Gln Ile Leu Lys Glu Lys Glu Gly Ala Asp Phe Ile Leu
 355 360 365

Leu Asn Phe Ser Phe Lys Asp Asn Phe Pro Phe Asp Pro Pro Phe Val
 370 375 380

Arg Val Val Ser Pro Val Leu Ser Gly Gly Tyr Val Leu Gly Gly Gly
 385 390 395 400

Ala Ile Cys Met Glu Leu Leu Thr Lys Gln Gly Trp Ser Ser Ala Tyr
 405 410 415

Ser Ile Glu Ser Val Ile Met Gln Ile Ser Ala Thr Leu Val Lys Gly
 420 425 430

Lys Ala Arg Val Gln Phe Gly Ala Asn Lys Ser Gln Tyr Ser Leu Thr
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<211> 1500
<212> PRT
<213> Homo sapiens

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<400> 36

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Met Thr Cys Asn Ser Cys Val Trp Thr Ile Glu Gln Gln Ile Gly Lys
          20          25          30

```

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Val Asn Gly Val His His Ile Lys Val Ser Leu Glu Glu Lys Asn Ala
          35          40          45

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```

Thr Ile Ile Tyr Asp Pro Lys Leu Gln Thr Pro Lys Thr Leu Gln Glu
          50          55          60

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Ala Ile Asp Asp Met Gly Phe Asp Ala Val Ile His Asn Pro Asp Pro
65          70          75          80

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Leu Pro Val Leu Thr Asp Thr Leu Phe Leu Thr Val Thr Ala Ser Leu
          85          90          95

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Thr Leu Pro Trp Asp His Ile Gln Ser Thr Leu Leu Lys Thr Lys Gly
          100          105          110

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Val Thr Asp Ile Lys Ile Tyr Pro Gln Lys Arg Thr Val Ala Val Thr
115 120 125

Ile Ile Pro Ser Ile Val Asn Ala Asn Gln Ile Lys Glu Leu Val Pro
130 135 140

Glu Leu Ser Leu Asp Thr Gly Thr Leu Glu Lys Lys Ser Gly Ala Cys
145 150 155 160

Glu Asp His Ser Met Ala Gln Ala Gly Glu Val Val Leu Lys Met Lys
165 170 175

Val Glu Gly Met Thr Cys His Ser Cys Thr Ser Thr Ile Glu Gly Lys
180 185 190

Ile Gly Lys Leu Gln Gly Val Gln Arg Ile Lys Val Ser Leu Asp Asn
195 200 205

Gln Glu Ala Thr Ile Val Tyr Gln Pro His Leu Ile Ser Val Glu Glu
210 215 220

Met Lys Lys Gln Ile Glu Ala Met Gly Phe Pro Ala Phe Val Lys Lys
225 230 235 240

Gln Pro Lys Tyr Leu Lys Leu Gly Ala Ile Asp Val Glu Arg Leu Lys
245 250 255

Asn Thr Pro Val Lys Ser Ser Glu Gly Ser Gln Gln Arg Ser Pro Ser
260 265 270

Tyr Thr Asn Asp Ser Thr Ala Thr Phe Ile Ile Asp Gly Met His Cys
275 280 285

Lys Ser Cys Val Ser Asn Ile Glu Ser Thr Leu Ser Ala Leu Gln Tyr
290 295 300

Val Ser Ser Ile Val Val Ser Leu Glu Asn Arg Ser Ala Ile Val Lys
305 310 315 320

Tyr Asn Ala Ser Ser Val Thr Pro Glu Ser Leu Arg Lys Ala Ile Val
325 330 335

Ala Val Ser Pro Gly Leu Tyr Arg Val Ser Ile Thr Ser Glu Val Glu

340

345

350

Ser Thr Ser Asn Ser Pro Ser Ser Ser Ser Leu Gln Lys Ile Pro Leu
 355 360 365

Asn Val Val Ser Gln Pro Leu Thr Gln Glu Thr Val Ile Asn Ile Asp
 370 375 380

Gly Met Thr Cys Asn Ser Cys Val Gln Ser Ile Glu Gly Val Ile Ser
 385 390 395 400

Lys Lys Pro Gly Val Lys Ser Ile Arg Val Ser Leu Ala Asn Ser Asn
 405 410 415

Gly Thr Val Glu Tyr Asp Pro Leu Leu Thr Ser Pro Glu Thr Leu Arg
 420 425 430

Gly Ala Ile Glu Asp Met Gly Phe Asp Ala Thr Leu Ser Asp Thr Asn
 435 440 445

Glu Pro Leu Val Val Ile Ala Gln Pro Ser Ser Glu Met Pro Leu Leu
 450 455 460

Thr Ser Thr Asn Glu Phe Tyr Thr Lys Gly Met Thr Pro Val Gln Asp
 465 470 475 480

Lys Glu Glu Gly Lys Asn Ser Ser Lys Cys Tyr Ile Gln Val Thr Gly
 485 490 495

Met Thr Cys Ala Ser Cys Val Ala Asn Ile Glu Arg Asn Leu Arg Arg
 500 505 510

Glu Glu Gly Ile Tyr Ser Ile Leu Val Ala Leu Met Ala Gly Lys Ala
 515 520 525

Glu Val Arg Tyr Asn Pro Ala Val Ile Gln Pro Pro Met Ile Ala Glu
 530 535 540

Phe Ile Arg Glu Leu Gly Phe Gly Ala Thr Val Ile Glu Asn Ala Asp
 545 550 555 560

Glu Gly Asp Gly Val Leu Glu Leu Val Val Arg Gly Met Thr Cys Ala
 565 570 575

Ser Cys Val His Lys Ile Glu Ser Ser Leu Thr Lys His Arg Gly Ile
580 585 590

Leu Tyr Cys Ser Val Ala Leu Ala Thr Asn Lys Ala His Ile Lys Tyr
595 600 605

Asp Pro Glu Ile Ile Gly Pro Arg Asp Ile Ile His Thr Ile Glu Ser
610 615 620

Leu Gly Phe Glu Ala Ser Leu Val Lys Lys Asp Arg Ser Ala Ser His
625 630 635 640

Leu Asp His Lys Arg Glu Ile Arg Gln Trp Arg Arg Ser Phe Leu Val
645 650 655

Ser Leu Phe Phe Cys Ile Pro Val Met Gly Leu Met Thr Tyr Met Met
660 665 670

Val Met Asp His His Phe Ala Thr Leu His His Asn Gln Asn Met Ser
675 680 685

Lys Glu Glu Met Ile Asn Leu His Ser Ser Met Phe Leu Glu Arg Gln
690 695 700

Ile Leu Pro Gly Leu Ser Val Met Asn Leu Leu Ser Phe Leu Leu Cys
705 710 715 720

Val Pro Val Gln Phe Phe Gly Gly Trp Tyr Phe Tyr Ile Gln Ala Tyr
725 730 735

Lys Ala Leu Lys His Lys Thr Ala Asn Met Asp Val Leu Ile Val Leu
740 745 750

Ala Thr Thr Ile Ala Phe Ala Tyr Ser Leu Ile Ile Leu Leu Val Ala
755 760 765

Met Tyr Glu Arg Ala Lys Val Asn Pro Ile Thr Phe Phe Asp Thr Pro
770 775 780

Pro Met Leu Phe Val Phe Ile Ala Leu Gly Arg Trp Leu Glu His Ile
785 790 795 800

Ala Lys Gly Lys Thr Ser Glu Ala Leu Ala Lys Leu Ile Ser Leu Gln
805 810 815

Ala Thr Glu Ala Thr Ile Val Thr Leu Asp Ser Asp Asn Ile Leu Leu
820 825 830

Ser Glu Glu Gln Val Asp Val Glu Leu Val Gln Arg Gly Asp Ile Ile
835 840 845

Lys Val Val Pro Gly Gly Lys Phe Pro Val Asp Gly Arg Val Ile Glu
850 855 860

Gly His Ser Met Val Asp Glu Ser Leu Ile Thr Gly Glu Ala Met Pro
865 870 875 880

Val Ala Lys Lys Pro Gly Ser Thr Val Ile Ala Gly Ser Ile Asn Gln
885 890 895

Asn Gly Ser Leu Leu Ile Cys Ala Thr His Val Gly Ala Asp Thr Thr
900 905 910

Leu Ser Gln Ile Val Lys Leu Val Glu Glu Ala Gln Thr Ser Lys Ala
915 920 925

Pro Ile Gln Gln Phe Ala Asp Lys Leu Ser Gly Tyr Phe Val Pro Phe
930 935 940

Ile Val Phe Val Ser Ile Ala Thr Leu Leu Val Trp Ile Val Ile Gly
945 950 955 960

Phe Leu Asn Phe Glu Ile Val Glu Thr Tyr Phe Pro Gly Tyr Asn Arg
965 970 975

Ser Ile Ser Arg Thr Glu Thr Ile Ile Arg Phe Ala Phe Gln Ala Ser
980 985 990

Ile Thr Val Leu Cys Ile Ala Cys Pro Cys Ser Leu Gly Leu Ala Thr
995 1000 1005

Pro Thr Ala Val Met Val Gly Thr Gly Val Gly Ala Gln Asn Gly
1010 1015 1020

Ile	Leu	Ile	Lys	Gly	Gly	Glu	Pro	Leu	Glu	Met	Ala	His	Lys	Val
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1055						1060					1065			
Ser	His	His	Lys	Ile	Leu	Ala	Ile	Val	Gly	Thr	Ala	Glu	Ser	Asn
1070						1075					1080			
Ser	Glu	His	Pro	Leu	Gly	Thr	Ala	Ile	Thr	Lys	Tyr	Cys	Lys	Gln
1085						1090					1095			
Glu	Leu	Asp	Thr	Glu	Thr	Leu	Gly	Thr	Cys	Ile	Asp	Phe	Gln	Val
1100						1105					1110			
Val	Pro	Gly	Cys	Gly	Ile	Ser	Cys	Lys	Val	Thr	Asn	Ile	Glu	Gly
1115						1120					1125			
Leu	Leu	His	Lys	Asn	Asn	Trp	Asn	Ile	Glu	Asp	Asn	Asn	Ile	Lys
1130						1135					1140			
Asn	Ala	Ser	Leu	Val	Gln	Ile	Asp	Ala	Ser	Asn	Glu	Gln	Ser	Ser
1145						1150					1155			
Thr	Ser	Ser	Ser	Met	Ile	Ile	Asp	Ala	Gln	Ile	Ser	Asn	Ala	Leu
1160						1165					1170			
Asn	Ala	Gln	Gln	Tyr	Lys	Val	Leu	Ile	Gly	Asn	Arg	Glu	Trp	Met
1175						1180					1185			
Ile	Arg	Asn	Gly	Leu	Val	Ile	Asn	Asn	Asp	Val	Asn	Asp	Phe	Met
1190						1195					1200			
Thr	Glu	His	Glu	Arg	Lys	Gly	Arg	Thr	Ala	Val	Leu	Val	Ala	Val
1205						1210					1215			
Asp	Asp	Glu	Leu	Cys	Gly	Leu	Ile	Ala	Ile	Ala	Asp	Thr	Val	Lys
1220						1225					1230			
Pro	Glu	Ala	Glu	Leu	Ala	Ile	His	Ile	Leu	Lys	Ser	Met	Gly	Leu

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Ile Ala Ser Gln Val Gly Ile Thr Lys Val Phe Ala Glu Val Leu 1265 1270 1275		
Pro Ser His Lys Val Ala Lys Val Lys Gln Leu Gln Glu Glu Gly 1280 1285 1290		
Lys Arg Val Ala Met Val Gly Asp Gly Ile Asn Asp Ser Pro Ala 1295 1300 1305		
Leu Ala Met Ala Asn Val Gly Ile Ala Ile Gly Thr Gly Thr Asp 1310 1315 1320		
Val Ala Ile Glu Ala Ala Asp Val Val Leu Ile Arg Asn Asp Leu 1325 1330 1335		
Leu Asp Val Val Ala Ser Ile Asp Leu Ser Arg Lys Thr Val Lys 1340 1345 1350		
Arg Ile Arg Ile Asn Phe Val Phe Ala Leu Ile Tyr Asn Leu Val 1355 1360 1365		
Gly Ile Pro Ile Ala Ala Gly Val Phe Met Pro Ile Gly Leu Val 1370 1375 1380		
Leu Gln Pro Trp Met Gly Ser Ala Ala Met Ala Ala Ser Ser Val 1385 1390 1395		
Ser Val Val Leu Ser Ser Leu Phe Leu Lys Leu Tyr Arg Lys Pro 1400 1405 1410		
Thr Tyr Glu Ser Tyr Glu Leu Pro Ala Arg Ser Gln Ile Gly Gln 1415 1420 1425		
Lys Ser Pro Ser Glu Ile Ser Val His Val Gly Ile Asp Asp Thr 1430 1435 1440		
Ser Arg Asn Ser Pro Lys Leu Gly Leu Leu Asp Arg Ile Val Asn 1445 1450 1455		

Tyr Ser Arg Ala Ser Ile Asn Ser Leu Leu Ser Asp Lys Arg Ser
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Leu Asn Ser Val Val Thr Ser Glu Pro Asp Lys His Ser Leu Leu
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 <212> DNA
 <213> Homo sapiens

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 <212> PRT

<213> Homo sapiens

<400> 38

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Tyr Gln Leu Glu Leu Asp Ala Ala Val Ala Glu Val Lys Leu Arg Asp
35 40 45

Asp Gln Tyr Thr Leu Glu His Met His Ala Phe Gly Met Tyr Asn Tyr
50 55 60

Leu His Cys Asp Ser Trp Tyr Gln Asp Ser Val Tyr Tyr Ile Asp Thr
65 70 75 80

Leu Gly Arg Ile Met Asn Leu Thr Val Met Leu Asp Thr Ala Leu Gly
85 90 95

Lys Pro Arg Glu Val Phe Arg Leu Pro Thr Asp Leu Thr Ala Cys Asp
100 105 110

Asn Arg Leu Cys Ala Ser Ile His Phe Ser Ser Ser Thr Trp Val Thr
115 120 125

Leu Ser Asp Gly Thr Gly Arg Leu Tyr Val Ile Gly Thr Gly Glu Arg
130 135 140

Gly Asn Ser Ala Ser Glu Lys Trp Glu Ile Met Phe Asn Glu Glu Leu
145 150 155 160

Gly Asp Pro Phe Ile Ile Ile His Ser Ile Ser Leu Leu Asn Ala Glu
165 170 175

Glu His Ser Ile Ala Thr Leu Leu Leu Arg Ile Glu Lys Glu Glu Leu
180 185 190

Asp Met Lys Gly Ser Gly Phe Tyr Val Ser Leu Glu Trp Val Thr Ile
195 200 205

Ser Lys Lys Asn Gln Asp Asn Lys Lys Tyr Glu Ile Ile Lys Arg Asp

210

215

220

Ile Leu Arg Gly Lys Ser Val Pro His Tyr Ala Ala Ile Glu Pro Asp
 225 230 235 240

Gly Asn Gly Leu Met Ile Val Ser Tyr Lys Ser Phe Thr Phe Val Gln
 245 250 255

Ala Gly Gln Asp Leu Glu Glu Asn Met Asp Glu Asp Ile Ser Glu Lys
 260 265 270

Ile Lys Glu Pro Leu Tyr Tyr Trp Gln Gln Thr Glu Asp Asp Leu Thr
 275 280 285

Val Thr Ile Arg Leu Pro Glu Asp Ser Thr Lys Glu Asp Ile Gln Ile
 290 295 300

Gln Phe Leu Pro Asp His Ile Asn Ile Val Leu Lys Asp His Gln Phe
 305 310 315 320

Leu Glu Gly Lys Leu Tyr Ser Ser Ile Asp His Glu Ser Ser Thr Trp
 325 330 335

Ile Ile Lys Glu Ser Asn Ser Leu Glu Ile Ser Leu Ile Lys Lys Asn
 340 345 350

Glu Gly Leu Thr Trp Pro Glu Leu Val Ile Gly Asp Lys Gln Gly Glu
 355 360 365

Leu Ile Arg Asp Ser Ala Gln Cys Ala Ala Ile Ala Glu Arg Leu Met
 370 375 380

His Leu Thr Ser Glu Glu Leu Asn Pro Asn Pro Asp Lys Glu Lys Pro
 385 390 395 400

Pro Cys Asn Ala Gln Glu Leu Glu Glu Cys Asp Ile Phe Phe Glu Glu
 405 410 415

Ser Ser Ser Leu Cys Arg Phe Asp Gly Asn Thr Leu Lys Thr Thr His
 420 425 430

Val Val Asn Leu Gly Ser Asn Gln Tyr Leu Phe Ser Val Ile Val Asp
 435 440 445

Pro Lys Glu Met Pro Cys Phe Cys Leu Arg His Asp Val Asp Ala Leu
450 455 460

Leu Trp Gln Pro His Ser Ser Lys Gln Asp Asp Met Trp Glu His Ile
465 470 475 480

Ala Thr Phe Asn Ala Leu Gly Tyr Val Gln Ala Ser Lys Arg Asp Lys
485 490 495

Lys Phe Phe Ala Cys Ala Pro Asn Tyr Ser Tyr Ala Ala Leu Cys Glu
500 505 510

Cys Leu Arg Arg Val Phe Ile Tyr Arg Gln Pro Ala Pro Met Ser Thr
515 520 525

Val Leu Tyr Asn Arg Lys Glu Gly Arg Gln Val Gly Gln Val Ala Lys
530 535 540

Gln Gln Val Ala Ser Leu Glu Thr Asn Asp Pro Ile Leu Gly Phe Gln
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Asp Arg Tyr Tyr His Glu Glu Glu Leu Glu Ser Ala Leu Arg Glu Ala
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Ala Ser Asn His Pro Ile Met Lys Thr Gly Glu Pro His Cys Pro Gly
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Asp Glu Asp Glu Thr Phe Lys Asp Gly Ile Thr Asn Gly Ala His Trp
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Tyr Asp Val Glu Gly Gly Met Gln Asp Tyr Asn Tyr Val Trp Ala Asn
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Leu Ile Glu Lys Val His Ile Gly Val Lys Gly Phe Val Lys Asp Ser
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Asn His Asn Ile Thr Thr Gly Arg Phe Gly Asp Phe Tyr Arg Leu Leu
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Val Pro Gly Thr Tyr Asn Leu Thr Val Val Leu Thr Gly Tyr Met Pro
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Leu Thr Val Thr Asn Val Val Val Lys Glu Gly Pro Ala Thr Glu Val
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Thr Gln Pro Glu Thr Ile Ala Val Met Ser Trp Met Lys Ser Tyr Pro
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Gly Gly Met Gln Asp Trp Asn Tyr Leu Gln Thr Asn Cys Phe Glu Val
755 760 765

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Thr Thr Tyr Lys Thr Gly Asp Tyr Trp Arg Leu Leu Val Pro Gly Thr
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Ser Ser Ser Thr Asn Asp Ala Ser Asp Pro Thr Thr Lys Glu Phe Glu

900

905

910

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Tyr Lys Asp Leu Ser Glu Phe Leu Arg Gly Leu Val Met Asn Tyr Pro
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His Ile Thr Asn Leu Thr Asn Leu Gly Gln Ser Thr Glu Tyr Arg His
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Ile Trp Ser Leu Glu Ile Ser Asn Lys Pro Asn Val Ser Glu Pro Glu
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Glu Pro Lys Ile Arg Phe Val Ala Gly Ile His Gly Asn Ala Pro Val
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Gly Thr Glu Leu Leu Leu Ala Leu Ala Glu Phe Leu Cys Leu Asn
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Tyr Lys Lys Asn Pro Ala Val Thr Gln Leu Val Asp Arg Thr Arg
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Ile Val Ile Val Pro Ser Leu Asn Pro Asp Gly Arg Glu Arg Ala
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His Ser Gln Val Phe Val His His Asp Ala Ala Ser Ser Val Val
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Ile Val Phe Asp Thr Asp Asn Arg Ile Phe Gly Leu Pro Arg Glu
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Thr Ala Cys Ile Ile Trp Cys Ile Cys Ser Ile Lys Ser Asn Arg
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His Lys Asp Gly Phe His Arg Leu Arg Gln His His Asp Glu Tyr
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Glu Asp Glu Ile Arg Met Met Ser Thr Gly Ser Lys Lys Ser Leu
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Leu Ser His Glu Phe Gln Asp Glu Thr Asp Thr Glu Glu Glu Thr
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Leu Tyr Ser Ser Lys His
1385